

13. (Once amended) The nucleic acid molecule of Claim 1, wherein said nucleic acid molecule selected from the group consisting of group (e) and group (f) further comprises a nucleic acid molecule encoding a linker.

14. (Reiterated) A composition comprising an excipient and an isolated nucleic acid molecule of Claim 1.

15. (Reiterated) A method to regulate an immune response comprising administering to an animal a composition of Claim 14.

16. (Reiterated) A method to produce a protein comprising culturing a recombinant cell as set forth in Claim 12.

REMARKS

Claims 17-20 have been canceled. Claims 1-7, and claim 13 have been amended.

I. Group Election

In response to the Restriction Requirement mailed November 25, 2002, Applicants provisionally elect to prosecute Group I with traverse for the reasons described below. Applicants note this election is made solely in the interest of expediting prosecution of this Application and Applicants reserve the right to traverse division between Groups II-IV and division between species in subsequent divisional filings. Applicants also reserve the right to file divisional Applications relating to these claims without the need to file a terminal disclaimer.

The Examiner has restricted the present Application into 4 different groups related to polynucleotides and their use in producing proteins, methods of treatment using nucleic acid molecules, polypeptides and antibodies, all further relating to feline interleukin-18 (IL-18), feline caspase-1 (casp-1), feline interleukin-12 (IL-12) and canine interleukin-12 (IL-12) molecules. Group I, consisting of Claims 1-14, 16 and 20 is drawn to the above-mentioned immunoregulatory nucleic acid molecules, methods of producing the proteins encoded by the nucleic acid molecules, as well as recombinant molecules, viruses and host cells comprising the states nucleic acid molecules. Immunoregulatory nucleic acid molecules of Group I Claims include SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:9-11, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:25, SEQ ID NO:26, SEQ ID

NO:29, SEQ ID NO:32, SEQ ID NO:35, SEQ ID NO:38, , SEQ ID NO:40, SEQ ID NO:41, SEQ ID NO:45, SEQ ID NO:46, SEQ ID NO:49, SEQ ID NO:52, SEQ ID NO:58, SEQ ID NO:61, SEQ ID NO:68 and SEQ ID NO:83. Proteins encoded by nucleic acids referred to in Group I claims include SEQ ID NO:2, SEQ ID NO:5, SEQ ID NO:8, SEQ ID NO:12, SEQ ID NO:15, SEQ ID NO:18, SEQ ID NO:21, SEQ ID NO:24, SEQ ID NO:27, SEQ ID NO:30, SEQ ID NO:33, SEQ ID NO:36, SEQ ID NO:39, SEQ ID NO:44, SEQ ID NO:47, SEQ ID NO:50, SEQ ID NO:53, SEQ ID NO:59, SEQ ID NO:62, SEQ ID NO:67, SEQ ID NO:102, SEQ ID NO:105 and SEQ ID NO:108.

Applicants traverse the restriction between Groups I and II to the extent that Group II recites the subject matter of Group I. Applicants submit that the subject matter of these Groups is sufficiently small and so closely related, that a thorough search for Group I should also include the subject matter of Group II. Specifically, the Claims of Group II are drawn to a method of regulating an immune response using the immunoregulatory nucleic acid molecules, or compositions thereof, of Group I. Applicants emphasize the method defined by Group II requires the use of nucleic acid molecules of Group I and, therefore, a search for the subject matter of either Group would be sufficient to examine the Claims of the related Group. Further, because the method of Group II cannot be practiced without the composition(s)/molecules of Group I, Applicants submit these Groups do not describe independent inventions as described in the M.P.E.P §802.01 and therefor request rejoinder of these Groups.

In any event, if the elected claims of Group I are allowable, Applicants reserve their right to amend the claims of Group II to be commensurate in scope with the product claims of Group I, and to request that the claims of Groups II that depend from or otherwise include all the limitations of the allowable product be rejoined and examined for patentability. *In re Brouwer*, 37 USPQ2d 1663 (Fed. Cir. 1996); *In re Ochiai*, 37 USPQ2d 1127 (Fed. Cir. 1995).

II. Selection of Sequences for Examination

The Examiner has further required the applicants to select no more than one individual sequence for examination on the merits. In response, Applicants provisionally elect SEQ ID NO:61 for examination with traverse for the reasons given below.

M.P.E.P § 803.04 states that although independent and distinct inventions should normally be restricted by an Examiner, in the case of nucleotide sequences, the requirements of

37 C.F.R. §1.141 are partially waived and a reasonable number of nucleotide sequences that encode different proteins can be examined together. It has been determined that normally ten sequences constitute a reasonable number for examination purposes. Group I describes nucleic acid sequences encoding several canine and feline immunoregulatory molecules. Several of these sequences are related, namely the canine and feline interleukin-12 (IL-12) p35 subunit sequences (e.g., SEQ ID NO:46 and SEQ ID NO:32) and the canine and feline IL-12 p40 subunit sequences (e.g., SEQ ID NO:61 and SEQ ID NO:38). In a general sense, all of these sequences are functionally related in that they all code for subunits that ultimately make up the mature IL-12 molecule. More specifically, the canine and feline IL-12 p35 subunit sequences are approximately 93% identical at the nucleotide level and 86% identical at the amino acid level as determined using SEQ ID NO:46 and its translation and the NIH BLAST program set with default parameters. Likewise, the canine and feline IL-12 p40 subunit sequences are approximately 93% identical at the nucleotide level and approximately 89% identical at the amino acid level as determined using SEQ ID NO 61 and its translation and the NIH BLAST program set with default parameters. Applicants submit that due to the functional relationship between the p35 and p40 subunits, namely formation of a functional IL-12 molecule, the nucleotide sequences encoding both the p35 and p40 subunits should be examined together. In addition, since the sequences of the canine and feline genes and proteins are so closely related and are likely to possess the same activity, Applicants respectfully submit that a thorough search for the subject matter of the canine sequences would be sufficient to enable the examination of the feline sequences without constituting an undue burden for the Examiner. While the number of sequences in these groups are in excess of ten, Applicants note that many of the sequences within each Group are merely fragments of larger sequences (e.g. SEQ ID NO:'s 26, 29, 38, 43 and 55, SEQ ID NO:'s 32, 35 and 101, SEQ ID NO:'s 46, 49 and 104, SEQ ID NO:'s 52, 61, 66, 58 and 107) and the sequences of these fragments are identical, or nearly so, over their length, with the sequence of the parent molecule. For the Examiner's convenience, a chart showing the relationship between the claimed sequences is shown below:

| SEQ ID NO: | Organism | Molecule | Description |
|------------|----------|------------------------------|---|
| 26 | feline | nFeIL-12p40 ₉₂₁ | nucleic acid sequence (NAS) mature IL-12p40 subunit |
| 28 | | nFeIL-12p40 ₉₂₁ | reverse complement (RC) of SEQ ID NO:26 |
| 29 | | nFeIL-12p40 ₉₈₇ | NAS full length IL-12p40 subunit |
| 31 | | nFeIL-12p40 ₉₈₇ | RC of SEQ ID NO:29 |
| 38 | | nFeIL-12 ₁₅₉₉ | NAS full length IL-12 single chain (p40) |
| 40 | | nFeIL-12 ₁₅₉₉ | RC of SEQ ID NO:38 |
| 43 | | nFeIL-12 ₁₅₃₃ | NAS mature IL-12 single chain (p40) |
| 45 | | nFeIL-12 ₁₅₉₉ | RC of SEQ ID NO:43 |
| 55 | | nFeIL-12p40-N ₉₈₅ | NAS partial IL-12p40 subunit 5' end |
| 57 | | nFeIL-12p40-N ₉₈₅ | RC of SEQ ID NO:55 |
| 32 | feline | nFeIL-12p35 ₆₆₆ | NAS full-length IL-12p35 subunit |
| 34 | | nFeIL-12p35 ₆₆₆ | RC of SEQ ID NO:32 |
| 35 | | nFeIL-12p35 ₅₉₁ | NAS mature IL-12p35 subunit |
| 37 | | nFeIL-12p35 ₅₉₁ | RC of SEQ ID NO:35 |
| 101 | | nFeIL-12p35-N ₅₆₁ | NAS partial IL-12p35 subunit 5' end |
| 103 | | nFeIL-12p35-N ₅₆₁ | RC of SEQ ID NO:101 |
| 46 | canine | nCaIL-12p35 ₆₆₆ | NAS full length IL-12p35 subunit |
| 48 | | nCaIL-12p35 ₆₆₆ | RC of SEQ ID NO:46 |
| 49 | | nCaIL-12p35 ₅₉₁ | NAS mature IL-12p35 subunit |
| 51 | | nCaIL-12p35 ₅₉₁ | RC of SEQ ID NO:49 |
| 104 | | nCaIL-12p35 ₁₄₅₅ | NAS IL-12p35 subunit 5' end |
| 106 | | nCaIL-12p35 ₁₄₅₅ | RC of SEQ ID NO:104 |
| 52 | canine | nCaIL-12p40 ₉₂₁ | NAS mature IL-12p40 |
| 54 | | nCaIL-12p40 ₉₂₁ | RC of SEQ ID NO:52 |
| 61 | | nCaIL-12 ₁₅₉₉ | NAS full-length IL-12 single chain (p40) |
| 63 | | nCaIL-12 ₁₅₉₉ | RC of SEQ ID NO:61 |
| 66 | | nCaIL-12 ₁₅₃₃ | NAS mature IL-12 single chain (p40) |
| 68 | | nCaIL-12 ₁₅₉₉ | RC of SEQ ID NO:66 |
| 58 | | nCaIL-12p40 ₉₈₇ | NAS full-length IL-12p40 |
| 60 | | nCaIL-12p40 ₉₈₇ | RC of SEQ ID NO:58 |
| 107 | | nCaIL-12p40 ₂₂₆₇ | NAS IL-12p40 subunit |
| 109 | | nCaIL-12p40 ₂₂₆₇ | RC of SEQ ID NO:107 |

These fragments may be considered to encode the same protein as the parent and therefor would not constitute an independent invention requiring an independent search. M.P.E.P § 803.04 Therefore, due to the overlapping and identical nature of the fragments, the number of distinct sequences that must be searched and examined would be reduced. In light of the above arguments, Applicants respectfully request the Examiner search sequences for each of the subunits, p35 and p40, from each specie, feline and canine, for examination on the merits.

Respectfully submitted,

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VERSION WITH MARKINGS SHOWING CHANGES

Claims 17-20 have been canceled.

Claims 1-16 have been amended as follows:

1. (Once amended) An isolated nucleic acid molecule selected from the group consisting of:
 - (a) [an isolated nucleic acid molecule selected from the group consisting of
 - (i) a nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:10, SEQ ID NO:9, SEQ ID NO:41, SEQ ID NO:11, and SEQ ID NO:13; and (ii) a nucleic acid molecule comprising at least 70 contiguous nucleotides identical in sequence to at least 70 contiguous nucleotides of a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:13, and SEQ ID NO:41;
 - (b) an isolated nucleic acid molecule selected from the group consisting of
 - (i) a nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:22, SEQ ID NO:23 and SEQ ID NO:25, and (ii) a nucleic acid molecule comprising at least 70 contiguous nucleotides identical in sequence to at least 70 contiguous nucleotides of a nucleic acid sequence selected from the group consisting of SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:22, SEQ ID NO:23 and SEQ ID NO:25;
 - (c)] an isolated nucleic acid molecule selected from the group consisting of:
 - (i) a nucleic acid molecule comprising ([a)]1) an isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:26, SEQ ID NO:29, and a nucleic acid sequence comprising at least 44 contiguous nucleotides identical in sequence to at least 44 contiguous nucleotides of a nucleic acid sequence selected from the group consisting of SEQ ID NO:26 and SEQ ID NO:29[;] , ([b)] 2) a nucleic acid linker of (XXX)_n wherein n=0 to 60[;] , and ([c)] 3) an isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:32, SEQ ID NO:35, and a nucleic acid molecule comprising at least 44 contiguous nucleotides identical in sequence to at least 44 contiguous nucleotides of a nucleic acid sequence selected from the group

consisting of SEQ ID NO:32 and SEQ ID NO:35, such that said nucleic acid molecule of (i) encodes a feline IL-12 single chain protein; and

(ii) a nucleic acid molecule comprising a nucleic acid sequence fully complementary to the coding strand of any of said nucleic acid molecules as set forth in (i);

[(d) b) an isolated nucleic acid molecule selected from the group consisting of:

(i) a nucleic acid molecule comprising [(a) 1] an isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:52 and SEQ ID NO:58, and a nucleic acid sequence comprising at least 47 contiguous nucleotides identical in sequence to at least 47 contiguous nucleotides of a nucleic acid sequence selected from the group consisting of SEQ ID NO:46 and SEQ ID NO:49; [(b) 2] a nucleic acid linker of $(XXX)_n$ wherein $n=0$ to 60 ; and [(c) 3] an isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:46, SEQ ID NO:49, and a nucleic acid molecule comprising at least 47 contiguous nucleotides identical in sequence to at least 47 contiguous nucleotides of a nucleic acid sequence selected from the group consisting of SEQ ID NO:46 and SEQ ID NO:49, such that said nucleic acid molecule of (i) encodes a canine IL-12 single chain protein; and

(ii) a nucleic acid molecule comprising a nucleic acid sequence fully complementary to the coding strand of any of said nucleic acid molecules as set forth in (i);

[(e) an isolated nucleic acid molecule selected from the group consisting of:

(i) a nucleic acid molecule having a nucleic acid sequence that is at least 92 percent identical to a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:10, SEQ ID NO:9, SEQ ID NO:41, SEQ ID NO:11, and SEQ ID NO:13; and (ii) a nucleic acid molecule comprising a fragment of a nucleic acid molecule of (i) wherein said fragment is at least 80 nucleotides in length;

(f) an isolated nucleic acid molecule selected from the group consisting of

(i) a nucleic acid molecule having a nucleic acid sequence that is at least 85 percent identical to a nucleic acid sequence selected from the group consisting of SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:22, SEQ ID NO:23 and SEQ ID NO:25, and (ii) a nucleic acid molecule comprising a fragment of a nucleic acid molecule of (i) wherein said fragment is at least 85 nucleotides in length;]

[(g) c) an isolated nucleic acid molecule selected from the group consisting of:

(i) a nucleic acid molecule comprising ([a]) 1) a nucleic acid molecule comprising a nucleic acid sequence that is at least 87 percent identical to a nucleic acid sequence selected from the group consisting of SEQ ID NO:26 and SEQ ID NO:29, or a fragment thereof of at least 55 nucleotides in length[;] , ([b]) 2) a nucleic acid linker of (XXX)_n wherein n=0 to 60[;] , and ([c]) 3) a nucleic acid molecule comprising a nucleic acid sequence that is at least 87 percent identical to a nucleic acid sequence selected from the group consisting of SEQ ID NO:32 and SEQ ID NO:35, or a fragment thereof of at least 55 nucleotides in length, such that said nucleic acid molecule (i) encodes a feline IL-12 single chain protein; and

(ii) a nucleic acid molecule comprising a nucleic acid sequence fully complementary to the coding strand of a nucleic acid molecule as set forth in (i); [and]

([h]) d) an isolated nucleic acid molecule selected from the group consisting of:

(i) a nucleic acid molecule comprising ([a]) 1) an isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:52, SEQ ID NO:58, and a nucleic acid sequence comprising at least 55 contiguous nucleotides identical in sequence to at least 55 contiguous nucleotides of a nucleic acid sequence selected from the group consisting of SEQ ID NO:52 and SEQ ID NO:58[;] , ([b]) 2) a nucleic acid linker of (XXX)_n wherein n=0 to 60[;] , and ([c]) 3) an isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:46, SEQ ID NO:49, and a nucleic acid molecule comprising at least 55 contiguous nucleotides identical in sequence to at least 55 contiguous nucleotides of a nucleic acid sequence selected from the group consisting of SEQ ID NO:46 and SEQ ID NO:49, such that said nucleic acid molecule of (i) encodes a canine IL-12 single chain protein; and

(ii) a nucleic acid molecule comprising a nucleic acid sequence fully complementary to the coding strand of any of said nucleic acid molecules as set forth in (i)[.] ;

([j]) a nucleic acid molecule having a nucleic acid sequence encoding an IL-18 protein selected from the group consisting of:

(i) a protein selected from the group consisting of ((a)) a protein having an amino acid sequence that is at least 92 percent identical to an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:5, SEQ ID NO:8 and SEQ ID NO:12, and ((b)) a protein comprising a fragment of a protein of ((a)), wherein said fragment is at least 30 amino acids in length; and

(ii) a protein comprising at least 25 contiguous amino acids identical in sequence to at least 25 contiguous amino acids of an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:5, SEQ ID NO:8 and SEQ ID NO:12;

(k) a nucleic acid molecule having a nucleic acid sequence encoding a caspase-1 protein selected from the group consisting of

(i) a protein selected from the group consisting of ((a)) a protein having an amino acid sequence that is at least 85 percent identical to an amino acid sequence selected from the group consisting of SEQ ID NO:15, SEQ ID NO:18, SEQ ID NO:21, and SEQ ID NO:24, and ((b)) a protein comprising a fragment of a protein of ((a)), wherein said fragment is at least 30 amino acids in length; and

(ii) a protein comprising at least 25 contiguous amino acids identical in sequence to at least 25 contiguous amino acids selected from the group consisting of SEQ ID NO:15, SEQ ID NO:18, SEQ ID NO:21, and SEQ ID NO:24;]

([l] e) a nucleic acid molecule having a nucleic acid sequence encoding an IL-12 single chain protein comprising an IL-12 p40 subunit domain linked to a IL-12 p35 subunit domain, wherein said p40 subunit domain is selected from the group consisting of

(i) a p40 subunit protein having an amino acid sequence that is at least 84 percent identical to an amino acid sequence selected from the group consisting of SEQ ID NO:27 and SEQ ID NO:30[.] ;

(ii) a p40 subunit protein comprising a fragment of a protein of (i) wherein said fragment is at least 30 amino acids in length[.] ; and

(iii) a p40 subunit protein comprising at least 23 contiguous amino acids identical in sequence to at least 23 contiguous amino acids of an amino acid sequence selected from the group consisting of SEQ ID NO:27 and SEQ ID NO:30 [and] ;

wherein said p35 subunit domain is selected from the group consisting of

(i) a p35 subunit protein having an amino acid sequence that is at least 84 percent identical to an amino acid sequence selected from the group consisting of SEQ ID NO:33 and SEQ ID NO:36[.] ;

(ii) a p35 subunit protein comprising a fragment of a protein of (i), wherein said fragment is at least 30 amino acids in length[.] ; and

(iii) a p35 subunit protein comprising at least 23 contiguous amino acids identical in sequence to at least 23 contiguous amino acids of an amino acid sequence selected from the group consisting of SEQ ID NO:33 and SEQ ID NO:36;

([m] f) a nucleic acid molecule having a nucleic acid sequence encoding an IL-12 single chain protein comprising an IL-12 p40 subunit domain linked to a IL-12 p35 subunit domain, wherein said p40 subunit domain is selected from the group consisting of

(i) a p40 subunit protein having an amino acid sequence that is at least 84 percent identical to an amino acid sequence selected from the group consisting of SEQ ID NO:53 and SEQ ID NO:59[.] ;

(ii) a p40 subunit protein comprising a fragment of a protein of (i), wherein said fragment is at least 40 amino acids in length[.] ; and

(iii) a p40 subunit protein comprising at least 31 contiguous amino acids identical in sequence to at least 31 contiguous amino acids of an amino acid sequence selected from the group consisting of SEQ ID NO:53 and SEQ ID NO:59; [and]

wherein said p35 subunit domain is selected from the group consisting of

(i) a p35 subunit protein having an amino acid sequence that is at least 84 percent identical to an amino acid sequence selected from the group consisting of SEQ ID NO:47 and SEQ ID NO:50[.] ;

(ii) a p35 subunit protein comprising a fragment of a protein of (i), wherein said fragment is at least 40 amino acids in length[.] ; and

(iii) a p35 subunit protein comprising at least 31 contiguous amino acids identical in sequence to at least 31 contiguous amino acids of an amino acid sequence selected from the group consisting of SEQ ID NO:47 and SEQ ID NO:50; and

([n] g) a nucleic acid molecule comprising a nucleic acid sequence fully complementary to the coding strand of any of said nucleic acid molecules as set forth in [(j), (k),] ([l] e) or ([m] f)

2. (Once amended) The nucleic acid molecule of Claim 1,

[wherein said nucleic acid molecule as set forth in (a), (e) or (j) comprises a nucleic acid sequence that encodes a feline IL-18 protein;

wherein said nucleic acid molecule as set forth in (b), (f) or (k) comprises a nucleic acid sequence that encodes a feline caspase-1 protein.]

wherein said nucleic acid molecule as set forth in ([c] a), (b), ([g] c), (d), [or] ([l] e) or (f) comprises a nucleic acid sequence that encodes a feline IL-12 single chain protein[; and

wherein said nucleic acid molecule as set forth in (d), (h) or (m) comprises a nucleic acid sequence that encodes a canine IL-12 single chain protein].

3. (Once amended) The nucleic acid molecule of Claim 1,

[wherein said nucleic acid molecule selected from the group consisting of (a), (e) and (j) encodes a protein having a function selected from the group consisting of (i) eliciting an immune response against an IL-18 protein having an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:5, SEQ ID NO:8 and SEQ ID NO:12[.] ; (ii) selectively binding to an antibody raised against an IL-18 protein having an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:5, SEQ ID NO:8, and SEQ ID NO:12[.] ; and (iii) exhibiting IL-18 activity;

wherein said nucleic acid molecule selected from the group consisting of (b), (f) and (k) encodes a protein having a function selected from the group consisting of (i) eliciting an immune response against a caspase-1 protein having an amino acid sequence selected from the group consisting of SEQ ID NO:15, SEQ ID NO:18, SEQ ID NO:21, and SEQ ID NO:24, (ii) selectively binding to an antibody raised against caspase-1 protein having an amino acid sequence selected from the group consisting of SEQ ID NO:15, SEQ ID NO:18, SEQ ID NO:21, and SEQ ID NO:24, and (iii) exhibiting caspase-1 activity; and]

wherein said nucleic acid molecule selected from the group consisting of ([c] a), ([d] b), ([g] c), ([h] d), ([l] e) and ([m] f) encodes a protein having a function selected from the group consisting of (i) eliciting an immune response against an IL-12 protein having an amino acid sequence selected from the group consisting of SEQ ID NO:39, SEQ ID NO:44, SEQ ID NO:62,

and SEQ ID NO:67, (ii) selectively binding to an antibody raised against an IL-12 protein having an amino acid sequence selected from the group consisting of SEQ ID NO:27, SEQ ID NO:30, SEQ ID NO:33, SEQ ID NO:36, SEQ ID NO:47, SEQ ID NO:50, SEQ ID NO:53, and SEQ ID NO:59, SEQ ID NO:102, SEQ ID NO:105, SEQ ID NO:108, SEQ ID NO:39, SEQ ID NO:40, SEQ ID NO:62, and SEQ ID NO:67, and (iii) exhibiting IL-12 activity.

4. (Once amended) The nucleic acid molecule of Claim 1, wherein said nucleic acid molecule comprises a nucleic acid molecule selected from the group consisting of [nFeIL-18-N₅₁₄, nFeIL-18-C₅₀₂, nFeIL-18₆₀₇, nFeIL-18₅₇₆, nFeIL-18₄₇₁, nFeCasp-1₁₂₃₃, nFeCasp-1-N₅₂₆, nFeCasp-1-C₅₀₀, nFeCasp-1₁₂₃₀,] nFeIL-12₁₅₉₉, nFeIL-12₁₅₃₃, nCaIL-12₁₅₉₉, and nCaIL-12₁₅₃₃.

5. (Once amended) The nucleic acid molecule of Claim 1, wherein said nucleic acid molecule is selected from the group consisting of:

(a) a nucleic acid molecule comprising a nucleic acid sequence that encodes a protein having an amino acid sequence selected from the group consisting of [SEQ ID NO:2, SEQ ID NO:5, SEQ ID NO:8, SEQ ID NO:12, SEQ ID NO:15, SEQ ID NO:18, SEQ ID NO:21, SEQ ID NO:24,] SEQ ID NO:39, SEQ ID NO:44, SEQ ID NO:62, and SEQ ID NO:67; and

(b) a nucleic acid molecule comprising an allelic variant of a nucleic acid molecule encoding a protein having any of said amino acid sequences of (a).

6. (Once amended) The nucleic acid molecule of Claim 1, wherein said nucleic acid molecule is selected from the group consisting of:

(a) a nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of [SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:10, SEQ ID NO:9, SEQ ID NO:41, SEQ ID NO:11, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:25,] SEQ ID NO:38, SEQ ID NO:40, SEQ ID NO:43, SEQ ID NO:45, SEQ ID NO:61, SEQ ID NO:63, SEQ ID NO:66, and SEQ ID NO:68; and

(b) a nucleic acid molecule comprising an allelic variant of a nucleic acid molecule comprising any of said nucleic acid sequences of (a).

7. (Once amended) A nucleic acid molecule selected from the group consisting of: the nucleic acid molecule of Claim 1([c] a)(i) comprising, in the following order, ([a]) 1), ([b]) 2), and ([c]) 3), the nucleic acid molecule of Claim 1([d] b)(i) comprising, in the following order, ([a]) 1), ([b]) 2), and ([c]) 3), the nucleic acid molecule of Claim 1([g] c)(i) comprising, in the

following order, ([a] 1), ([b] 2), and ([c] 3), and the nucleic acid molecule of Claim 1([h] d)(i) comprising, in the following order, ([a] 1), ([b] 2), and ([c] 3).

8. The nucleic acid molecule of Claim 7, wherein said nucleic acid sequence encoding said linker comprises SEQ ID NO:83.

9. (Reiterated) The nucleic acid molecule of Claim 7, wherein said single chain protein comprises a p40 subunit at the N-terminus and a p35 subunit at the C-terminus.

10. (Reiterated) A recombinant molecule comprising a nucleic acid molecule as set forth in Claim 1.

11. (Reiterated) A recombinant virus comprising a nucleic acid molecule as set forth in Claim 1.

12. (Reiterated) A recombinant cell comprising a nucleic acid molecule as set forth in Claim 1.

13. (Once amended) The nucleic acid molecule of Claim 1, wherein said nucleic acid molecule selected from the group consisting of group ([l] e) and group ([m] f) further comprises a nucleic acid molecule encoding a linker.

14. (Reiterated) A composition comprising an excipient and an isolated nucleic acid molecule of Claim 1.

15. (Reiterated) A method to regulate an immune response comprising administering to an animal a composition of Claim 14.

16. (Reiterated) A method to produce a protein comprising culturing a recombinant cell as set forth in Claim 12.